APPENDIX B

DEFINITION OF TERMS

ACUTE TOXICITY, as used in the context of mixing zones, refers to aquatic lethality caused by passage through the mixing zone by migrating fish moving up or downstream, or by less mobile forms drifting through an effluent plume, or benthic organisms within the mixing zone boundaries.

ACUTELY TOXICITY CONDITIONS, as used in the context of mixing zones, refers to lethality that occurs to mobile aquatic organisms that move or drift through the mixing zone, or to benthic organisms that live within the mixing zone.

ANTHROPOGENIC: Pertaining to, or resulting from human activities and behavior, e.g., treated wastewater, industrial wastewater, stormwater etc.

ARITHMETIC MEAN (μ) also called the average, is easily calculated as described below:

Arithmetic mean = $\mu = \sum x / n$
where:
$\sum x$ is the sum of the measured ambient water concentrations, and
n is the number of samples.

Simply put, the measured ambient water concentrations are first added, then divided by the number of samples.

AVERAGE MONTHLY LIMITATION (AML) means the highest allowable average of daily pollutant discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of measurements.

AVERAGE WEEKLY LIMITATION means the highest allowable average of daily pollutant discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of measurements.

BIOACCUMULATION is the uptake, concentration, and retention of substances by an organism from its surrounding medium through gill membranes or epithelial tissue and from food.

BIOACCUMULATIVE pollutants are those substances are taken up by an organism from its surrounding medium through gill membranes or epithelial tissue and from food. Generally, these substances are concentrated and retained in the body of the organism.

BIOLOGICALLY-BASED DESIGN FLOW refers to the method for determining design flows developed by the U.S. EPA Office of Research and Development which directly uses the averaging periods and exceedance frequencies specified in the acute and chronic aquatic life criteria for individual pollutants (e.g., 1 day and 3 years for acute criteria, and 4 days and 3 years for the chronic criteria). Biologically-based design flows can be calculated using the program DFLOW.

CARCINOGENIC pollutants are substances that are known to cause cancer in living organisms.

COEFFICIENT OF VARIATION (*CV*) is a measure of the data variability and is calculated as the estimated standard deviation divided by the arithmetic mean of the observed values.

COMPLETELY-MIXED DISCHARGE CONDITION means no measurable difference in the concentration of a pollutant exists across a transect of the water body at or near the discharge point.

DILUTION CREDIT is the amount of dilution granted to a discharge in the calculation of a water quality-based effluent limitation, based on the allowance of a specified mixing zone. It is calculated from the dilution ratio.

DILUTION RATIO is the critical low flow of the receiving water divided by the flow of the effluent discharged.

DYNAMIC permit limits are based on considerations of the variability in receiving water and effluent flow rates. For example, discharges could be limited to a percentage of receiving water flow.

ESTIMATED STANDARD DEVIATION (σ) is calculated as follows:

Estimated standard deviation = $\sigma = (\sum [(x - \mu)^2] / (n - 1))^{0.5}$
where:
x is the observed value;
μ is the arithmetic mean of the observed values; and
n is the number of samples.

EXCEEDANCE is defined to occur whenever the instantaneous concentration of a pollutant in the receiving water is above the criterion/objective.

EXCURSION is defined to occur when the average concentration of a pollutant in the receiving water over the duration of the averaging period is above the criterion/objective.

GEOMETRIC MEAN is the exponential of the arithmetic mean value of the measured concentrations' natural logarithms. It can be calculated as follows:

Geometric mean = $(x_1x_2x_3....x_n)^{1/n}$
where:

$(x_1x_2x_3....x_n)$ is the product of the measured concentrations, and n is the number of samples.

HARMONIC MEAN (FLOW) is the ratio of the geometric mean flow to the arithmetic mean flow. It is expressed as $Q_{hm} = Q_{gm} / Q_{am}$.

INCOMPLETELY-MIXED DISCHARGE CONDITION is a condition that does not meet the meaning of a completely-mixed discharge condition.

INITIAL DILUTION is the process that results in the rapid and irreversible turbulent mixing of wastewater with receiving water near the point of discharge.

MAJOR DISCHARGER shall mean municipal NPDES facilities with $\geq$ 1 million gallons per day design flow and non-municipal NPDES facilities with $\geq$ 80 points.

MAXIMUM DAILY LIMITATION (MDL) means the highest allowable daily discharge of a pollutant, over a calendar day (or 24-hour period). For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

MAXIMUM DAILY MEAN FLOW (of effluent) is the highest arithmetic mean of daily mean flows observed over the period of discharge.

MEAN DAILY MEAN FLOW (of effluent) is the arithmetic mean of daily mean flows observed over the period of discharge

MEDIAN is the middle number, if the observed ambient water concentrations are arranged in numerical order. For an even number of samples, the median is the average of the two middle numbers. Half of all measurements are below the median and half are above the median.

MINOR DISCHARGER shall mean municipal NPDES facilities with $\leq$ i million gallons per day design flow and non-municipal NPDES facilities with $\leq$ 80 points.

MIXING ZONE is a limited volume of receiving water that is allocated for mixing with a wastewater discharge where water quality criteria can be exceeded without causing adverse effects to the overall water body.

MUTAGENIC pollutants are substances that are known to cause a mutation (i.e., change in a gene or chromosome) in living organisms.

OBJECTIONABLE BOTTOM DEPOSITS are an accumulation of materials or substances on or near the bottom of a water body which create conditions that adversely impact aquatic life, human health, beneficial uses, or aesthetics. These conditions include, but are not limited to, the accumulation of pollutants in the sediments and other conditions which result in harm to benthic organisms, production of food chain organisms, or fish egg development. The presence of such deposits shall be determined by RWQCB(s) on a case-by-case basis.

PERSISTENT pollutants are substances for which degradation or decomposition in the environment is nonexistent or very slow.

QUALITY ASSURANCE (QA) shall mean an integrated system of management activities involving planning, implementation, assessment, reporting, and quality improvement to ensure that a process, item, or service is of the type and quality needed and expected by the client.

QUALITY CONTROL (QC) shall mean the overall system of technical activities that measure the attributes and performance of a process, item, or service against defined standards to verify that they meet the stated requirements established by the client.

SOURCE OF DRINKING WATER is any water designated as municipal or domestic supply (MUN) in a Basin Plan.

STEADY-STATE permit limits are based on a single receiving water condition, usually a statistically based, low-flow condition such as 7Q10 (7Q10 is the average low flow that occurs for seven consecutive days with a statistical frequency of once every 10 years).

TECHNOLOGY-BASED permit limits are effluent limitations that are based on the treatment requirements under Section 301 (b) of the Federal Clean Water Act (CWA) that are the minimum level of control that must be imposed in a permit issued under Section 402 of the CWA, such as secondary treatment or best available technology economically achievable. (See 40 CFR Section 125.3 for a more detailed discussion of technology-based treatment requirements.)

TERATOGENIC pollutants are substances that are known to cause structural abnormalities or birth defects in living organisms.

WATER QUALITY-BASED permit limits are effluent limitations that are based on any requirements in addition to, or more stringent than, technology-based permit limits and which are necessary to achieve water quality standards established under Section 303 of the Federal Clean Water Act, including State narrative criteria for water quality.

1Q10 is the lowest flow that occurs for one day with a statistical frequency of once every 10 years.

7Q10 is the average low flow that occurs for seven consecutive days with a statistical frequency of once every 10 years

30Q5 is the lowest average flow that occurs for 30 consecutive days with a statistical frequency of once every 5 years.

95th Percentile is the concentration that 95 percent of the observed concentrations would fall below. It can be found by ranking the observed concentrations or can be calculated as follows:

a. Assuming a normal distribution of data:

95th Percentile $= \mu + 1.645 * \sigma$
where:
μ is the arithmetic mean of the observed values; and
σ is the estimated standard deviation.

b. Assuming a log-normal distribution of data (the natural logarithms of the observed values should first be calculated):

95th Percentile $= \exp[\mu_y + 1.645 * \sigma_y^2]$
where:
μ_y is the arithmetic mean of the natural logarithms of the observed values; and
σ_y^2 is the square of the standard deviation, also called the variance, of the natural logarithms of the observed values.

99th Percentile is the concentration that 99 percent of the observed concentrations would fall below. It can be found by ranking the observed concentrations or can be calculated as follows:

a. Assuming a normal distribution of data:

99th Percentile $= \mu + 2.326 * \sigma$
where:
μ is the arithmetic mean of the observed values; and
σ is the estimated standard deviation.

b. Assuming a log-normal distribution of data (the natural logarithms of the observed values should first be calculated):

99th Percentile $= \exp[\mu_y + 2.326 * \sigma_y^2]$
where:
μ_y is the arithmetic mean of the natural logarithms of the observed values ; and
σ_y^2 is the square of the standard deviation, also called the variance, of the natural logarithms of the observed values.